

Remarks

The Office Action of October 10, 2003 has been received and its contents carefully reviewed. Claims 1, 4 – 15, 17, and 18 are currently pending in the application. Claims 1, 4, 13 – 15, 17 and 18 have been amended. Claims 2, 3, 16 and 19 – 28 have been cancelled.

The present invention is directed to an electrical connector comprising a plurality of contacts mounted on a substrate. The substrate and contacts are heated using induction heating. In this manner the contacts can be differentially heated and heated in a manner that will not negatively affect the substrate.

In the claims, claims 1, 4, 13 – 15, 17 and 18 have been amended solely to more clearly define and recite the present invention. The amendments are not in any way related to the Examiner's rejection based on prior art or any applied or cited prior art.

Claims 1, 2, and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2001/0009724 to Chen et al. in view of any of U.S. Patent Number 4,390,377 to Hogg, U.S. Patent Number 6,093,267 to Arnaud et al or Japanese Patent Number 11-289645. The rejection is respectfully traversed.

With regard to claim 2, this rejection has been rendered moot by the cancellation of that claim. With regard to claims 1 and 13, this rejection is respectfully traversed with respect to the applied art.

Applicants would like to point out that the combination of Chen with one or more of the applied secondary references (Hogg, Arnaud or JP '645, alone or in combination) is inappropriate for at least the following reasons.

The examiner states that Chen, "does not disclose induction heating as a method of heat treatment." The examiner thereafter sites the secondary references to address this shortcoming of Chen, stating "each of the secondary references indicates it is well known in the art to heat treat coated wires by induction heating process."

First, we need to define "the art." The present invention is directed to the art of contacts, more particularly contacts mounted on a substrate. While Chen is directed to the art of contacts on a substrate, it is very narrowly tailored in its focus and does not suggest applying its teachings with teachings outside the art of coated microcontacts. The focus of Chen is the coatings of wire contacts mounted on a substrate. Furthermore, Chen teaches various types of coatings which provide different properties. Chen also teaches heat treating the coated contacts to provide distinct properties. However, Chen does **not** teach or even suggest different methods for heat treating the contacts. Furthermore, Chen does **not** appreciate, discuss or even suggest differentially heating different portions of the contacts for different amounts to provide beneficial properties. Still further, Chen **fails** to teach or suggest any detrimental effects heating can have on a substrate or the impact of high temperature heating on certain substrates.

The inventors of the present invention appreciated the negative impacts heat treating the contacts in a contact/substrate combination in conventional ovens (as suggested by Chen) at temperatures and/or times necessary to provide various desirous results had on low temperature (inexpensive) substrates and necessity to use high temperature (expensive) substrates to avoid those negative impacts. The present inventors realized that conventional ovens, which typically enclose the contact/substrate combination, not only uniformly heat the contacts but also expose the substrate to the same heating effects as the contacts. This exposes the substrate to direct heat and also heat by conduction from the mounted contacts. This heat has significant negative impacts on the substrate.

To this end, what is needed is a heating system that can heat the contacts without heating the substrate, either directly or indirectly. Furthermore, what is needed is a system and method to provide a contact which is mounted to a substrate yet differentially heated thereby resulting in distinct properties at different portions of the contact. Furthermore, what is needed is a method that

will heat treat the contacts and the substrate and that would affect them differently so that one could efficiently heat the contacts without deleterious effects on less expensive, low temperature substrates. This would require heating only one side of the combination and only heating portions of the contacts to certain temperatures.

As Chen fails to teach or suggest the aforementioned items, one of ordinary skill in the art who has reviewed Chen would not think to look to any other reference to address negative impacts of the noted items.

With regard to the secondary references Arnaud, Hogg and the JP'645 references, while each of these references are directed to induction heat treating of wire or cable, none of them are applicable to heat treating contacts mounted on a substrate. Each of these secondary references teaches moving an item (long lengths of wire or cable, perhaps hundreds of feet on a spool) through the coil and heating the item uniformly. The item is run through the heat treating system using a spool system. The item travels along a central axis of the induction coil. None of these references appears to teach or suggest using their techniques in any type of application other than treating extremely long lengths of wire or cable where the wire is run through the coil and surely there is no suggestion or motivation to use these techniques to heat treat contacts mounted on a substrate.

The item of the present invention (a contact/substrate combination) does not lend itself to traveling through a coil and the systems of these secondary references do not teach or suggest running the combination to one side of the coil, as would be required to differentially heat the contacts. As such, there is no motivation to combine the Chen reference with any of these secondary references. Furthermore, even if the teachings of these secondary references were combined with the teachings of the Chen reference it would not result in differentially heat treated contacts, as recited in the claims 1 and 13, as amended.

In light of the foregoing, it is clear that there is no motivation for one of ordinary skill in the art to combine the teachings of Chen with these secondary references to induction heat treat a contact (perhaps 3-5 mm long) mounted on a substrate. Any such combination could only be the result of the benefit of the present application to cherry pick features disclosed in the prior art and combining these features. Any such hindsight-based combination is inappropriate and improper for an obviousness rejection under section 103. It is well established that there must be a suggestion or a motivation within the applied references to combine the teachings, as of the time of the invention and not from the Examiner's point of view having already read the claims.

With regard to Evans, while Evans does teach induction heating which treats one portion differently than another portion, there isn't any motivation for one of ordinary skill in the art at the time of the invention to combine the teachings of Evans with Chen.

Evans teaches heating only relatively large metallic objects (fasteners in this case compared to contacts in the present invention) to relatively high temperatures (700 C). While the end of the fastener farther from the induction heating coil will reach temperatures below the end closest to the induction heating coil they will still reach relatively high temperatures through conduction (about 500 – 600 C). If the farther end of the metallic object were mounted on a substrate (as required in claims 1 and 13) any conventional substrate (both low and high temperature) used in Chen, for example, would be damaged by the high temperatures.

Furthermore, Evans teaches surface hardening of the fastener tip by quenching the fastener once the tip is heated to 700 C. As such, the interior of the fastener does not reach the same temperature as the surface of the fastener. As such, the desirable properties which motivated the present inventors will not be achieved by the method and system taught in Evans.

As such, one of ordinary skill in the art at the time of the invention would not be motivated to use the teachings of Evans with the teachings of Chen to differentially induction heat treat a plurality of contacts mounted on a substrate.

It is respectfully requested that the outstanding rejections be reconsidered and withdrawn and that the presently pending claims be allowed.

If the examiner has any questions regarding the presently pending claims which could be easily resolved by a telephone conference, the examiner is respectfully requested to contact the Applicants' representative at the below listed number.

Respectfully submitted,

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